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HERPETO GEOGRAPHY OF PUERTO RICO. V. DESCRIPTION OF A NEW SPECIES OF *SPHAERODACTYLUS* FROM DESECHEO ISLAND

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INTRODUCTION

The Puerto Rican island shelf (Greater Puerto Rico) has received considerable attention from herpetologists, and the herpetofauna of the larger islands is now reasonably well known. However, the small islands and keys, with some exceptions, have not been studied in a thorough way. A faunal survey of these islands is now in progress (Levins and Heatwole, 1963), and some of the results have been published (Heatwole *et al.*, 1963, 1965; Rolle *et al.*, 1964; Heatwole and Torres, 1967). The present paper represents a further contribution in that direction.

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DESECHEO ISLAND

Desecheo is a hot, dry, relatively steep-sided island located in the Mona Channel 12 miles west of Punta Higüero, P. R. It consists largely of volcanic rock, although some limestone deposits are present. It has a diameter of 1 mile and a maximum elevation of 715 ft. (U. S. Dept. Comm. Coast and Geodetic Survey, 1962). The vegetation is cactus scrub and xeric woodland. Large numbers of

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Boobies nest on the island; terrestrial hermit crabs form a conspicuous faunal element. Though uninhabited by humans, a small herd of feral goats is present.

Its known herpetofauna consists of 4 species: *Alsophis portoricensis* (Grant, 1932), *Ameiva desecheensis* (Heatwole and Torres, 1967), an *Anolis* reported by Wetmore (1918) to be intermediate between *A. cristatellus* and *A. monensis* (now being studied by the author), and the new species of *Sphaerodactylus* described below.

No specimens of *Sphaerodactylus* from Desecheo were available to Thomas and Schwartz (1966), and they singled out this island as "one of the few West Indian islands from which *Sphaerodactylus* has not been reported." The present study fills in this gap. All scale counts were made after the method of King (1962).

SPHAERODACTYLUS LEVINSI sp. nov.¹

Holotype: UPRRP 4566 (donated to the Museum of Comparative Zoology, Harvard University, MCZ No. 100274), a male taken 28 May 1965 on Desecheo Island, Puerto Rico, by the author.

Paratypes: UPRRP 4565, 4567, 4570 (males), and UPRRP 4571-72 (females), collected 27-29 May 1965 on Desecheo Island, P. R., by the author, R. Levins, and F. MacKenzie.

Distribution: Known only from the type locality, Desecheo Island, where it is not abundant; found chiefly under stones and dead wood at the edges of dry drainage gullies.

Diagnosis: A species of *Sphaerodactylus* characterized by: (1) a prominent light-colored frontal bar, bordered by brown completely separating it from other light-colored areas (Fig. 1), (2) shoulder patch not bordered by a lighter color but enclosing two white, round ocelli, (3) lack of sexual dichromism, (4) scale rows around mid-body 46-48, and (5) lamellae under 4th toe 7-8.

Description of holotype: An adult male with snout-vent length of 28.2 mm; dorsal scales axilla to groin 28, ventral scales axilla to groin 31; mid-body rows of scales 48; 4th toe lamellae 8; internasals 1; supralabials to mid-eye 3; escutcheon 5 by 17 scales; dorsal scales keeled, imbricate, no microscopic hairs or knobs detected; no granular dorsal scales; ventral scales smooth, nearly round.

¹ This species is named in honor of Dr. Richard Levins, who was a stimulating and pleasant companion on expeditions to more than 100 islands and keys of the Puerto Rican shelf, and who contributed to this and other studies by collecting many herpetological specimens. The abbreviation UPRRP refers to the collections of the University of Puerto Rico (Rio Piedras).

venter dirty white; dorsal ground-color brown with darker brown spots tending to be aligned in longitudinal rows; a U-shaped, dark brown mark over sacrum; head pattern with a dark brown medial preorbital stripe diverging anterior to the eyes to enclose a longitudinal, conspicuous, light-colored bar (frontal bar), extending nearly to the occipital region, where the brown stripes re-converge, isolating bar from other light-colored areas; lateral, dark brown preorbital stripes diverge around eye and extend separately across the temporal region to break up into spots near the shoulder; prominent, round dark brown occipital spot followed posteriorly by two pairs of faint spots; no well-defined nuchal spot; oval, dark brown shoulder patch enclosing a pair of light-colored ocelli. Ocelli and frontal bar are near-white and are conspicuously lighter than any other features; occipital spot and shoulder patch (near-black) conspicuously darker than any other feature.

Variation: Coloration was extremely uniform, and the description of the holotype could serve almost equally well for any of the other specimens examined, including both sexes, except for (1) varying tendencies of the lateral head-stripes to coalesce with the faint spots behind the occipital spot, and (2) a narrow line running anteriorly from the occipital spot to connect with the brown color enclosing the frontal bar in two specimens (males). Escutcheons were 4-6 by 12-17 in scale number; 4th toe lamellae were 7 or 8; upper labials were 3 or 4; internasals did not vary (always 1); scale rows around mid-body were 48 with one exception (46); dorsal rows axilla to groin varied from 27 to 32 (mean 29.0; standard error 0.82) and ventral ones axilla to groin from 28 to 32 (mean 29.8; standard error 0.66).

Relationships: *S. levinsi* is most closely related to *S. monensis* and *S. macrolepis*. It is distinguished from *S. macrolepis* by its higher number of dorsal scales, its lower number of toe lamellae, and by lacking sexual dichromism. It differs from *S. monensis* by lacking a light border around the scapular patch and by having round rather than transverse ocelli. The conspicuous frontal bar (Fig. 1) is not shared with either species.

Thomas and Schwartz (1966) have suggested that with the possible exception of *S. beattyi* of St. Croix all the *Sphaerodactylus* on the Puerto Rican shelf are the result of radiation from a single ancestral invading stock. According to their scheme, a proto-*macrolepis* form separately gave rise to *S. roosevelti* and *S. monensis*, before continuing on to modern *macrolepis*, which in turn gave rise to two other species groups as well as a variety of subspecies.

S. monensis is now found only on Mona Island (about 40 miles west of Puerto Rico), and *S. levinsi* only on Desecheo Island (12 miles west of Puerto Rico). I suggest that the proto-*macrolepis* ancestor succeeded in reaching Mona and Desecheo, where it separately gave rise to the two present-day forms. Heatwole and MacKenzie (1967) have shown that during the Pleistocene, conditions were much more favorable for flotsam transport from Puerto Rico to both Mona and Desecheo than they are now. The southwestern coast of Puerto Rico extended considerably farther into the Mona Channel, thereby reducing inter-island distances and also deflecting currents in more favorable directions. At maximum extension, the current passing westward along the southern coast of Puerto Rico would have proceeded almost directly toward Mona, and it was probably at this time that proto-*macrolepis* arrived there. As the southwestern coast of Puerto Rico subsequently receded, it would have permitted the current to swing increasingly toward its present northward direction through the Mona Channel. Then Desecheo, rather than Mona, would have been in the more direct path of the current. Land configuration was also conducive to eddy currents between Desecheo and Punta Higüero, Puerto Rico. On the one hand, this probably caused increased isolation of the Mona population, permitting its differentiation into *S. monensis*, and on the other, made possible flotsam transport of proto-*macrolepis* to Desecheo. Gene flow via flotsam transport of animals was probably maximal between Puerto Rico and Desecheo at that time, as further recession of the southwestern coast increased the effective inter-island distance and resulted in currents less favorable for flotsam transport between them. Today, any flotsam reaching Desecheo would have its most likely origin on the extreme southwestern tip of Puerto Rico, rather than geographically nearer points. This increased isolation undoubtedly facilitated divergence of the Desecheo population to form *S. levinsi*.

Additional evidence for the isolation of the Mona population before that of Desecheo is that the former has retained a light border around the scapular patch, a character no longer present in the western populations of *S. macrolepis* or in *S. levinsi*.

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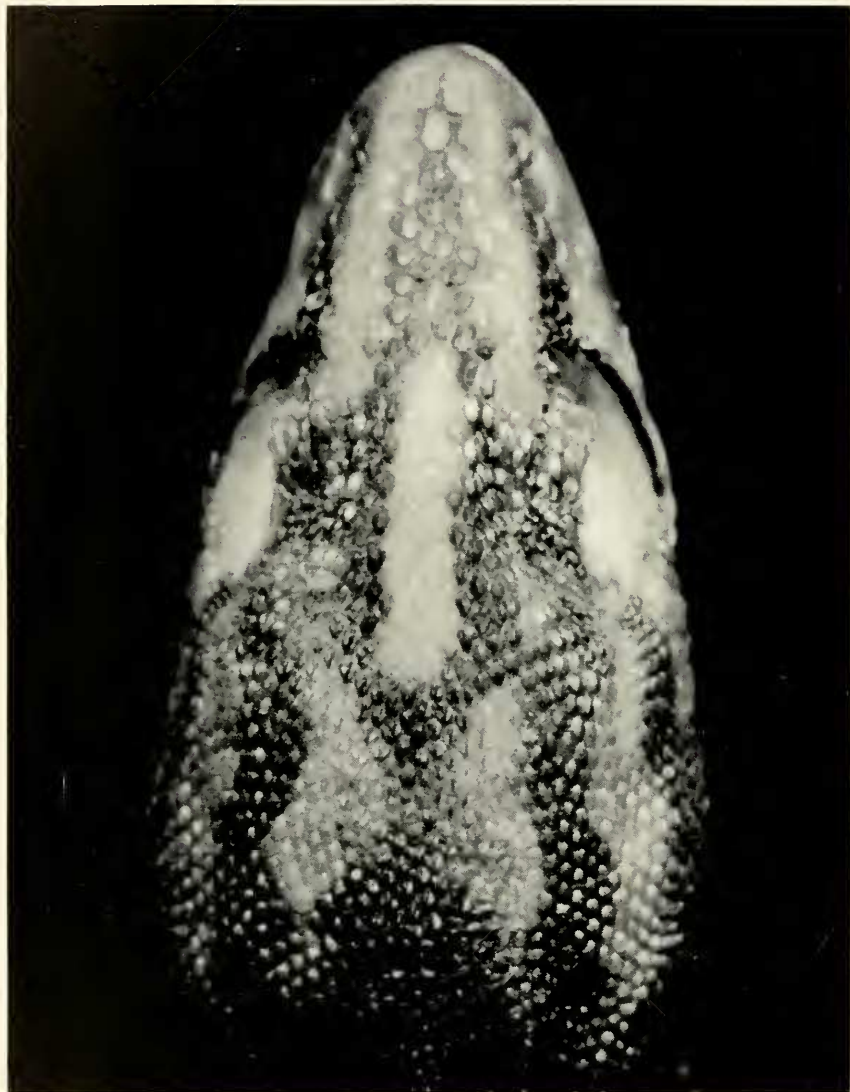


Figure 1. Head of holotype of *Sphaerodactylus levinsi*.